and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

Claims 1-14 and 16-24 are all of the claims pending in the present Application. Claim 15 has been canceled above, in order to expedite the allowance of remaining claims. A Divisional Application is being filed to cover the subject matter of this canceled claim 15. A Supplemental Amendment will shortly be filed to add new claims to the Divisional Application.

Claims 21-24 have been added to the present Application. The Examiner objected to claims 14-16 of the present Application as being in improper multiple dependent claims. Applicants gratefully acknowledge the Examiner's comment that claims 8-12 stand as allowable if rewritten in independent format and have rewritten claims 8 and 9 accordingly. Claim 1 stands rejected under 35 USC §102 as anticipated by Japanese Patent JP-09-148810 to Ishitobi. Claims 2-7, 13, and 17-20 stand rejected under 35 USC §103(a) as unpatentable over Ishitobi.

These rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

A dielectric resonator (10) having three surfaces formed by chamfering three ridged portions sharing an apex of a dielectric block and another three surfaces adjacent respectively thereto, in which each of the chamfered surfaces and the adjacent surfaces thereto offers an angle of 45 degrees and an area ratio of the chamfered surfaces with respect to the adjacent surfaces is 45%, is mounted in a cut-off waveguide and of a generally rectangular parallelopiped (21) and feeding probe (24) and (25) are provided for comprising a dielectric

filter. The present invention has a number of advantages over the prior art, including a feature that the various modes are simultaneously coupled.

II. THE CLAIM OBJECTION

The Examiner objected to claims 14-16 as being in improper multiple dependent form. Claim 15 is canceled above. Applicants have corrected this problem by adding claim 21 to cover the dependency of multiple dependent claim 10. Accordingly, Applicants respectfully request that the Examine reconsider and withdraw this objection.

III. THE PRIOR ART REJECTION

The Examiner asserts that JP-09-148810 to Ishitobi discloses "... a dielectric resonator characterized in that three resonant modes of a dielectric block of a generally rectangular parallelepiped are coupled by chamfering a ridge portion of the dielectric block and chamfering another ridge portion which is not parallel to the first chamfered ridge portion at the same time."

However, one important feature of the present invention is that the chamfer involves a single ridge. In contrast, Figures 6 and 8 of Ishiboti clearly shows that it relies upon having chamfers on opposing ridges.

Hence, turning to the clear language of the claims, relative to claim 1, there is no teaching or suggestion of " ... characterized in that said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge not being parallel to said second ridge portion", as required by the claim.

Additionally, there are actually several important features of the present invention that differ from the resonance filter taught in Ishitobi. First, the surface of the Ishitobi dielectric cube is overlaid by a metal (see paragraph 0009 and claim 2 of Ishitobi). The present invention does not have this metal coating (see new claim 23).

Second, the Ishitobi resonator has four chamfered ridge portions. The present invention has only two chamfered ridge portions, as already mentioned above.

Third, there is a difference of modes. Because of the conductive coating, the Ishitobi resonator is a uniform medium surrounded by metal so it has three modes (TE110 mode, etc.) generated within the dielectric cube (reference Ishitobi Figures 1-3). In contrast, as shown in Figure 2, because the present invention does not have a metal exterior coating, the three modes (TE11 mode, etc., as described in the specification for that figure) generated include the space surrounding the dielectric.

Fourth, there is a difference in coupling. The manner of coupling in the Ishitobi resonator is restricted to the following (see Ishitobi paragraph 0008):

(A) the external circuit is coupled to the first mode;

(B) the first mode is coupled to the second mode;

(C) the second mode is coupled to the third mode; and

(D) the third mode is coupled to the external circuit.

In contrast, the manner of coupling in present invention is not restricted.

Thus, in view of these differences, the present invention is completely different from the Ishitobi resonator and is not obvious in view of this reference for at least the following reasons. The modes used in Ishitobi are completely different from those of the present invention. For example, the mode in Ishitobi is TE110 mode, while the corresponding mode

of the present invention is TE11 mode. Both modes have the prefix "TE", however, the magnetic field is rotated within the cube in TE110 mode as depicted in Ishitobi Figure 1, whereas the electric field is rotated within the dielectric cube in TE11 mode, as depicted in Figure 2 of the present disclosure.

These modes are completely different. As a result, even if one phenomenon is available in one of the two modes, the corresponding phenomenon is not necessarily available in the other. Namely, Ishitobi teaches a method of coupling TE110 mode and TE101 mode to each other by chamfering two ridge portions parallel to each other and opposite to each other. Based on this teaching in Ishitobi, one of ordinary skill in the art would not consider that two TE11 modes are coupled to each other by chamfering two ridge portions not parallel to each other.

Relative to claim 6, there is no teaching or suggestion of "... which three resonant modes of a dielectric block of a generally rectangular parallelopiped are coupled."

Relative to new claim 23, because of the metal overlay taught in Ishitobi, there is no teaching or suggestion of "...a material of said dielectric resonator being exclusively said dielectric material."

Additionally, relative to claims 3-5 and 18-20, these claims address the configuration shown exemplary in Figure 7 of the present application in which multiple resonators are mounted inside the same waveguide. The examiner relies on Figure 11 of Ishitobi, which is described in paragraph 16 of the translation as being the equivalent circuit of the configuration illustrated by Figure 4 having K=31). Thus, Ishitobi actually makes no suggestion of combining multiple resonators within a waveguide, as asserted by the Examiner.

For the reasons stated above, the claimed invention is fully patentable over the cited

references.

Further, the other prior art of record has been reviewed, but it too even in combination with Ishitobi fails to teach or suggest the claimed invention.

IV. Formal matters and Conclusion

The Examiner objected to the drawings because no loop-type feeding probe was shown on any drawing. Applicants submit under separate cover a Request for a Drawing Change to add a generic loop-type feeding probe as an inset to Figure 5 and to add a new Figure 11A that shows such loop-type feeding probe specifically applied in the present invention. In accordance with the third paragraph of MPEP 706.03(o), no new matter is added since the subject matter was originally claimed, was originally discussed in the specification at lines 8-10 of page 10, and is well known in the art, as demonstrated by Figure10 of Ishitobi, a reference cited by the Examiner as prior art.

In view of the foregoing, Applicant submits that claims 1-14 and 16-25, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The following paragraph has been added after the first full paragraph on page 16:

The inset in Figure 5 shows exemplarily a feeding probe as being a loop-type probe rather than a rod-type probe. Figure 11A additionally shows the loop-type feeding probe 8 as specifically incorporated in an exemplary embodiment of the present invention.

The following new paragraph has been added at the bottom of page 11:

Fig. 11A shows the dielectric filter of Figure 11 as configured using a loop-type feeding probes 8.

IN THE CLAIMS:

Claim 15 has been canceled.

Claims 1, 3, 5, 6, 8-10, 12, and 14-16 have been amended, as follows:

1. (Amended) A dielectric resonator comprising:

a dielectric block having a generally rectangular parallelopiped shape, [characterized in that] wherein three resonant modes of [a] said dielectric block [of a generally rectangular parallelopiped] are coupled, wherein said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering [another] a single one of a second ridge portion of said dielectric block, [which is] said first chamfered ridge not being parallel to said second ridge portion [at the same time].

3. (Amended) A dielectric filter claimed in claim 2 characterized in disposing two or more of said dielectric resonators in said cut-off waveguide and providing [means for] a partition [consisting of] comprising a conductive material between said dielectric resonators.

5. (Amended) A dielectric filter claimed in claim 2, 3, or 4, further comprising [characterized in installing another] a second resonator [further than said dielectric resonator] in said cut-off waveguide, said second resonator being a type different than that described in claim 1.

6. (Amended) A dielectric resonator [characterized in comprising] in which three resonant modes of a dielectric block [in the form] of a generally rectangular parallelopiped are coupled, wherein said block has three planes formed by chamfering three ridge portions of said dielectric block, respectively, said three chamfered ridges not being parallel to each other [having three-ridge portions chamfered thereof and generating TE01 δ mode on electro-

magnetically independent three surfaces of said dielectric block].

8. (Amended) [A dielectric resonator claimed in claim 6 or 7 characterized in] A dielectric resonator comprising a dielectric block in the form of a generally rectangular parallelopiped having three-ridge portions chamfered thereof and generating TE01 δ mode on electro-magnetically independent three surfaces of said dielectric block and having three surfaces of A1, A2, A3 (hereafter called surfaces A) formed by chamfering three ridge portions sharing a point of said dielectric block and three surfaces of B1, B2, B3 (hereafter called surfaces B) adjacent to each of the surfaces A respectively, in which an angle between 40 degrees and 50 degrees, both inclusive, is offered by said surfaces A and said surfaces B and an area ratio of said surfaces A with respect to said surfaces B and an area ratio of said surfaces A with respect to said surfaces B stands between 1% and 200%, both inclusive.

9. (Amended) [A dielectric resonator claimed in claim 6 or 7 characterized in] A dielectric resonator comprising a dielectric block in the form of a generally rectangular parallelopiped having three-ridge portions chamfered thereof and generating TE01 δ mode on electro-magnetically independent three surfaces of said dielectric block and having three surfaces A1, A2, A3 (hereafter called surfaces A) formed by chamfering three ridge portions sharing an apex of said dielectric block, another three surfaces of A'4, A'5, A'6 (hereafter called surfaces A') formed by chamfering three ridge portions sharing another apex on a diagonal line of said apex, another three surfaces of B'1, B'2, B'3 (hereafter called surfaces B') adjacent to each of surfaces A and surfaces A' respectively and still another three surfaces of C'1, C'2, C'3 (hereafter called surfaces C') adjacent to each of surfaces A and surfaces A' respectively, wherein an angle of 40 degrees through 50 degrees is offered by the surfaces A and B' or by the surfaces A' and C' and an area ratio of said surfaces A with respect to surfaces B' or an area ratio of said surfaces A' with respect to said surfaces C' stand between 1% and 200% both inclusive, respectively.

10. (Amended) A dielectric filter using the dielectric resonator claimed in claim[s] 8 or 9 characterized in that an angle between 40 degrees and 50 degrees, both inclusive, is offered by said three surfaces A or A' formed by chamfering three ridge portion sharing an apex of said dielectric block and other three surfaces B or B' adjacent thereto respectively and the surfaces A or A' and surfaces B or B' adjacent thereto respectively have three opposing surfaces of C1, C2, C3 (hereafter called surfaces C) or the surfaces C' and characterized in providing a feeding probe near the surface B and B', the surfaces B' and B', the surfaces C and C', or the surfaces C' and C'.

12. (Amended) A dielectric filter using the dielectric resonator claimed in claim 8, further comprising a feeding probe, characterized in that an angle offered by a direction p and p' of the feeding probe with respect to the x, y, z axes of said dielectric resonator are variable within the range between -45 degrees and +45 degrees, both inclusive, while in use.

14. (Amended) A dielectric filter claimed in claim[s 10 through] 11, 12, or 13, [characterized in that] wherein said feeding probe [is] comprises a rod-type feeding probe.

16. (Amended) A dielectric filter using the dielectric resonator claimed in claim[s 7 through] 7, 8, or 9 [characterized in mounting], further comprising at least two or more of said dielectric resonators in said cut-off waveguide of a generally rectangular parallelopiped.

The following new claims 21-24 were added, as follows.

21. (New) A dielectric filter of claim 10, wherein said feeding probe comprises a rod-type feeding probe.

22. (New) A dielectric resonator comprising:

a dielectric block having a generally rectangular parallelopiped shape, wherein resonant modes of said dielectric block are coupled by chamfering a first ridge portion of said dielectric block and chamfering a second ridge portion, said first chamfered ridge not being parallel to said second chamfered ridge, said dielectric resonator being devoid of metal material, thereby permitting a magnetic field to extend outside said dielectric block.

23. (New) A dielectric resonator as claimed in claim 6, wherein said dielectric block further has a second set of three planes formed by chamfering another three ridge portions of said dielectric block, each said chamfered ridge of said second set of three chamfered ridges being opposite a respective one of said three chamfered ridges.

24. (New) A dielectric resonator as claimed in claim 6, wherein said three resonant modes are $TE_{01\delta}$ modes.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 3/11/02

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